

Listing of Claims:

1. (Currently Amended) An image-processing method for creating processed image data ~~by applying a spatial filtering processing to~~ ~~from~~ source image data ~~via an image-conversion processing including at least one spacial-filtering processing,~~ ~~said method comprising the steps of:~~

5 ~~setting a at least one predetermined upper-limit value for a variation amount of said source image data indicating an amount of difference between said source image data and said processed image data; , before performing an image conversion processing through which said source image data are converted to said processed image data by applying said spatial filtering processing; and then~~

10 ~~performing said image-conversion processing for to convert said source image data into said processed image data by applying said at least one spatial-filtering processing to the source image data within a range of said variation amount limited by said predetermined upper-limit value.~~

15 2. (Currently Amended) The image-processing method of claim 1, wherein ~~said at least one spatial-filtering processing comprises a plurality of different spatial-filtering processing(s) processings, characteristics of which are different~~

5 each other, a predetermined upper-limit value for a variation
amount is set for each of the plurality of spatial-filtering
processings based on characteristics of the respective spatial-
filtering processings, and the plurality of spatial-filtering
processings are performed either one of simultaneously in
10 parallel or and sequentially one by one. in said image conversion
processing, and said predetermined upper limit value is set for
every spatial filtering processing, corresponding to each of said
characteristics of them.

3. (Currently Amended) The image-processing method of
claim 2, wherein said plurality of spatial-filtering processings
comprise a first spatial filter, having a characteristic to
emphasize for emphasizing an amplitude of image data residing in
5 a first spatial frequency band, and also having a first
upper limit value set as said predetermined upper limit value,
and a second spatial filter, having a characteristic to
de-emphasize for de-emphasizing an amplitude of image data
residing in a second spatial frequency band; and also having
10 wherein a first upper-limit value is set as the
predetermined upper-limit value for the first spatial filter, and
a second upper-limit value is set as said the predetermined
upper-limit value for the second spatial filter; , are provided
in said plurality of spatial-filtering processing(s), and

15 wherein said first spatial frequency band is higher than said second spatial frequency band, and said first upper-limit value is greater than said second upper-limit value.

4. (Currently Amended) The image-processing method of claim 2, wherein said plurality of spatial-filtering processings comprise a corresponding plurality of spatial filters are provided in said plurality of spatial filtering processing(s), and each of them corresponding said plurality of spatial filters corresponds to each a respective one of said plurality of spatial-filtering processing(s), processings; and

5 wherein [[,]] each of said spatial-filtering processings is only applied to pixel data when an absolute value of said a variation amount for the corresponding spatial-filtering processing is higher than a predetermined lower-limit value, said absolute value of the variation amount being derived by applying said spatial-filtering processing to each pixel data value corresponding to the spatial filter of each of said plurality of spatial filters, is higher than a predetermined lower limit value, said corresponding spatial-filtering processing is applied to said pixel data.

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Claims 5 and 6 (Canceled).

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7. (Currently Amended) ~~The~~ An image-processing method of ~~claim 6, for creating a variable sized image by applying one of an enlargement processing and a reduction processing to source image data including a plurality of color components, said method comprising:~~

applying a plurality of different spatial-interpolation processing methods to said source image data, said spatial-interpolation processing methods corresponding respectively to said plurality of color components;

wherein at least one of said spatial-interpolation processing methods for processing a corresponding one of the color components is performed in accordance with a magnification factor of said enlargement processing or reduction processing;

wherein said spatial-interpolation processing methods are performed by employing weighted-addition average values of a plurality of pixels, ~~and based on~~ look-up tables (LUTs) of weighting coefficients [[,]] corresponding to said plurality of spatial-interpolation processing methods; ~~are provided,~~ and

wherein a new look-up table is created by performing a weighted averaging operation ~~in respect to~~ with said look-up tables in accordance with the magnification factor, and said at least one spatial-interpolation processing method that is performed in accordance with the magnification factor is performed by employing the new look-up table. ~~is further~~

~~performed in response to said magnification factor of either said enlargement or said reduction processing, in order to create new look-up tables for spatial interpolation processing(s).~~

Claim 8 (Canceled).

9. (Currently Amended) An image-processing method for creating processed image data by applying a spatial-filtering processing and ~~either one of~~ an enlargement ~~or processing~~ and a reduction processing to source image data, ~~under a condition that~~ 5 ~~when~~ a magnification factor of ~~either~~ said one of the enlargement ~~or said processing~~ and the reduction processing is lower than a predetermined value, said method comprising ~~the steps of~~:

10 performing (i) a first size-varying processing to vary a size of an image ~~up~~ to a predetermined intermediate size, ~~established in advance~~ and ~~an~~ (ii) a first angle-rotating processing to rotate ~~an angle of~~ said image ~~up to~~ by a predetermined first angle value; ~~being a predetermined rotating angle,~~

15 applying said spatial-filtering processing to image data processed by said size-varying processing and said angle-rotating processing; and

performing ~~again said~~ (i) second size-varying processing to further vary said size of said image ~~up to~~ an a predetermined

20 ~~objective size, also established in advance and said (ii) second angle-rotating processing to reversely rotate said angle of said image up to by a second angle value, said second angle value~~ being opposite said first angle value.

Claims 10 and 11 (Canceled).

12. (Currently Amended) ~~The An~~ image-processing method of claim 11, further comprising the steps of:

5 extracting a plurality of couples of pixels, each of said couples of pixels comprising two pixels positioned symmetrically with respect to an objective pixel to be processed through an image-processing;

calculating differential values between said two pixels and said objective pixel for each of said plurality of couples of pixels;

10 extracting a specific couple of pixels having a minimum differential value out of said plurality of couples of pixels;

when said minimum differential value is lower than a predetermined first threshold value, setting a weighted-addition average value of said specific couple of pixels and said objective pixel, as a new value of the objective pixel;

establishing a new threshold value, ~~which is obtained by~~ adding a predetermined positive value to said minimum differential value;

extracting all of ~~specific~~ the couples of pixels $[\cdot, \cdot]$
20 ~~having~~ differential values ~~of which~~ are lower than said new threshold value, ~~out of said plurality of couples of pixels;~~ and setting an average value of ~~image data, included in~~ of said ~~specific~~ extracted couples of pixels, as a value of ~~a noticed~~ the objective pixel.

Claim 13 (Canceled).

14. (Currently Amended) An image-processing method for processing source image data, said method comprising ~~the steps of:~~

5 setting a predetermined first threshold value predetermined ~~in advance~~ and a maximum radius from a noticed pixel to an objective pixel in the source image data, said noticed pixel being a pixel to be processed by an image-processing, to an and said objective pixel $[\cdot, \cdot]$ being an object for comparison, ~~with respect to said source image data;~~

10 applying a signal-smoothening processing to said source image data based on the ~~basis of~~ said first threshold value and a

differential value between said noticed pixel and said objective pixel to generate second source image data;

15 setting a second threshold value, which is smaller than said first threshold value, and ~~a~~ an expanded radius, which is larger than said maximum radius; and

applying ~~again~~ said signal-smoothening processing to said second source image data based on the second threshold value and the expanded radius.

15. (Currently Amended) The image-processing method of claim 14, wherein said source image data ~~are~~ is obtained by applying a gradation-converting processing to image data outputted by an image inputting apparatus, and at least one of said first threshold value ~~and/or~~ and said second threshold value ~~are/is found~~ is determined based on the basis of gradation-conversion characteristics in the vicinity of a signal value of said noticed pixel ~~to be processed by said image-processing~~.

16. (Currently Amended) An image-processing method for processing source image data including a plurality of color components to convert said source image data into processed image data, each of ~~which includes~~ said plurality of color components including three data sets of ~~at least three~~ dimensions,

including one of data set which represents brightness information, and another two of data sets which represent chrominance coded information, said method comprising the steps of:

10 applying a first spatial-filtering processing to a the data set representing said brightness information; and

applying a second spatial-filtering processing to all of said three data sets;

15 wherein a power capacity for emphasizing a low-spatial frequency region is greater in said second spatial-filtering processing ~~is greater than that~~ in said first spatial-filtering processing.

17. (Currently Amended) The image-processing method of claim 16, further comprising ~~the step of:~~ performing a color coordinate-converting processing by in which said brightness information and said chrominance coded information are converted to ~~each of~~ color component signals, after applying said first spatial-filtering processing and before applying said second spatial-filtering processing.

18. (Currently Amended) An image-processing apparatus for processing an image, comprising:

an image-inputting section to acquire image data of a source image from an image recording medium or a document having said source image thereon;

an image-processing section to apply ~~an~~ the image-processing method recited in claim 1 to said image data acquired by said image inputting section, so as to create processed image data; and

an image-outputting section to output said image in either at least one of: a first mode ~~that~~ in which said processed image data ~~are~~ is written onto an information-recording medium, ~~or~~ a second mode ~~that~~ in which said processed image is ~~written on an~~ ~~image recording medium to obtain a hardcopy~~ printed, ~~or and~~ a third mode ~~that~~ in which said processed image data is displayed on an image-displaying device. [[;]]

~~wherein said image processing section employs anyone of the image processing methods described in claims 1-17.~~

19. (Original) An image-processing method for creating processed image data by applying a spatial-filtering processing and a size-converting processing in an enlarging direction to source image data, comprising the steps of:

5 determining whether an effect of a sharpness-emphasizing processing, to be performed in said spatial-filtering processing, should be relatively strong or weak, based on instructive

information in regard to image-processing items inputted in advance; and

10 applying said spatial-filtering processing at first, and then, said size-converting processing to said source image data, when determining that said effect of said sharpness-emphasizing processing should be relatively strong; or
 applying said size-converting processing at first, and then, 15 said spatial-filtering processing to said source image data, when determining that said effect of said sharpness-emphasizing processing should be relatively weak.

20. (Original) An image-processing apparatus for processing an image, comprising:

an image-inputting section to acquire image data of a source image from an image recording medium or a document having said 5 source image;

an instructive-information inputting section to input instructive information in regard to image-processing items to be performed in said image-processing apparatus;

10 an image-processing section to apply an image-processing to said image data acquired by said image inputting section, so as to create processed image data; and

an image-outputting section to output said image in either a first mode that said processed image data are written onto an

15 information-recording medium, or a second mode that said image is written on an image recording medium to obtain a hardcopy, or a third mode that said image is displayed on an image-displaying device;

20 wherein said image-processing section determines whether an effect of a sharpness-emphasizing processing, to be performed in a spatial-filtering processing, should be relatively strong or weak, based on said instructive information in regard to said image-processing items inputted by said instructive-information inputting section; and

25 wherein said image-processing section applies_said spatial-filtering processing at first, and then, said size-converting processing to said image data, when determining that said effect of said sharpness-emphasizing processing should be relatively strong; or said image-processing section applies said size-converting processing at first, and then, said spatial-filtering processing to said image data, when determining that said effect of said sharpness-emphasizing processing should be relatively weak.

Claims 21 and 22 (Canceled) .

23. (Original) The image-processing method of claim 16, wherein said second spatial-filtering processing further comprises the steps of:

finding sum-of-product values between noticed pixels and
5 peripheral pixels;

establishing said sum-of-product values as values of said noticed pixels; and

extracting said peripheral pixels, to be employed for a calculation, out of a plurality of discontinuous pixels, wherein
10 distance intervals for extracting said peripheral pixels are unequal relative to each other.